

Appl. No. 10/596,475
Amtd. Dated March 10, 2009
Reply to Office Action of December 10, 2008

Attorney Docket No. 81707.0201
Customer No.: 26021

REMARKS/ARGUMENTS:

New claims 16-24 are added. Support for new claim 16 can be found at p. 8, line 29-p. 9, line 18 of Applicant's specification. Support for new claim 17 can be found at p. 8, lines 29-35 of Applicant's specification. Support for new claims 18 and 19 can be found at p. 10, line 32-p. 11, line 13 of Applicant's specification. Support for new claim 20 can be found at p. 11, lines 6-10 of Applicant's specification. Support for new claim 21 can be found at p. 11, lines 10-13 of Applicant's specification. Support for new claim 22 can be found at p. 14, lines 1-4 of Applicant's specification. Support for new claims 23 and 24 can be found at p. 5, lines 13-15 of Applicant's specification. Claims 1-24 are pending in the application. Reexamination and reconsideration of the application, as amended, are respectfully requested.

The present invention relates to a laminated piezoelectric device and, more specifically, to a laminated piezoelectric device of the co-fired type in which conducting layers and piezoelectric layers are formed by co-firing, to a method of producing the same, and to an injection apparatus equipped with the laminated piezoelectric device. (Applicant's specification, at p. 1, lines 4-10).

CLAIM REJECTIONS UNDER 35 U.S.C. § 103:

Claims 1-11 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Tsuda et al. (JP 2006-228866A). Applicant respectfully traverses this rejection. Claim 1 is as follows:

A laminated piezoelectric device obtained by alternately laminating piezoelectric layers containing Pb and conducting layers containing palladium as a conducting component, wherein the piezoelectric layer formed between the two conducting layers has layer

regions where Pb and Pd are mixed together in interfacial portions thereof relative to said conducting layers, said layer regions having a thickness of not larger than 3% of the thickness of said piezoelectric layer.

Claim 1 requires the following limitations (a) to (c):

- (a) alternately laminating piezoelectric layers containing Pb and the conducting layers containing palladium as a conducting component;
- (b) the piezoelectric layer formed between the two conducting layers has layer regions where Pb and Pd are mixed together in the interfacial portions thereof relative to said conducting layers; and
- (c) said layer regions have a thickness of not larger than 3% of the thickness of said piezoelectric layer.

The above limitations, particularly (b) and (c) provide a laminated piezoelectric device having excellent characteristics. For example, the laminated piezoelectric device of the present invention features a large adhering strength between the conducting layer and the piezoelectric layer, as well as a large insulation resistance of the piezoelectric layer. (Applicant's specification, at p. 2, lines 2-14).

In contrast, Tsuda merely teaches the use of a lead-zirconate-titanate system as a material of the piezoelectric crystal layer in the piezoelectric actuator (Tsuda, paragraph [0036]). That is, Tsuda teaches the use of only a material containing Pb as a material of the piezoelectric layer. Stated differently, Tsuda teaches only limitation (a) of the present invention.

Tsuda fails to teach or suggest limitations (b) or (c) of the present invention. Consequently, Tsuda's system would not be expected to offer the advantages of the present invention.

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In light of the foregoing, Applicant respectfully submits that Tsuda cannot render claim 1 obvious, because Tsuda fails to teach or suggest each and every claim limitation. Claims 2-11 and 15 depend from claim 1 and cannot be rendered obvious for at least the same reasons as claim 1. Withdrawal of this rejection is thus respectfully requested.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (310) 785-4600 to discuss the steps necessary for placing the application in condition for allowance.

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,
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